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TO: Examiner Golightly (F: 571.270.4715)
FROM: Tayan B. Patel (P: 202.973.2620)
DATE: July 6, 2010
RE: Telephonic Examiner Interview regarding 033082M312 (USSN 10/577,314)

During the Interview, we would like to discuss the amendments provided below in view of the cited art relied upon in the Office Action dated, May 10, 2010.

By amendment, Applicants have defined a "transition operation" whereby the feed rate is reduced from a first feed rate. By so doing, the claimed invention compensates for hydrophilic and hydrophobic areas on the surface of the wafer. Next, the spin dry rinse process has been clarified to supply "only pure water" at a second feed rate which is less than the first feed rate while rotating the wafer and moving the pure-water feed point toward a periphery of the wafer. Rotation of the wafer is maintained after stopping supply of pure water once the pure-water feed point has reached the periphery of the wafer.

The combination of Mertens and Fujiyama does not teach or suggest Applicants' claimed spin dry process.

Please call me so that we can schedule a telephonic Interview this week of July 6th. I will be out of the office the week of July 12-16th.

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1. (Currently Amended) A substrate cleaning method for cleaning target substrates, the method comprising:

holding a target substrate having a surface with both hydrophobic and hydrophilic areas present thereon in a substantially horizontal state on a holder;

then, performing a rinse process on the target substrate by supplying only pure water at a first feed amount onto a surface both the hydrophobic and hydrophilic areas of the target substrate from a pure-water feed point positioned at a center of the surface while rotating the target substrate; [[and]]

continuous with the rinse process [[step]], performing a transition operation by reducing a feed amount of the pure water supplied from the first feed amount, while supplying the pure water to the target substrate from the pure-water feed point positioned at the center of the surface center so that the supply is smaller than the supply of pure water used in the rinse process at the without stopping [[the]] supply of the pure water and while rotating the target substrate, so as to cause a liquid film of the pure water formed on the target substrate to be thinner than that in the rinse process; [[and]]

continuous with the reducing of the feed amount step transition operation, performing a spin dry process on the target substrate by moving the pure-water feed point outward from the center of the surface center while supplying the pure water as an only liquid at a reduced second feed amount smaller than the first feed amount and while rotating the target substrate, so as to form a liquid film outside of the center surface feed point of the pure water on the surface of the target substrate outside the pure-water feed point being moved and to dry the surface of the target substrate inside the pure-water feed point being moved, and further by keeping rotation of the target substrate for a predetermined time after stopping supply of the pure water when the pure-water feed point reaches a position near a peripheral edge of the target substrate; and

finishing the spin dry process by stopping rotation of the target substrate, and unloading the target substrate from the holder without performing any dry process on the target substrate after said stopping rotation of the target substrate.

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2. (Original) The substrate cleaning method according to claim 1, wherein in said spin dry process, a speed of moving the pure-water feed point to the substrate outward from the center of the substrate is made faster at an outer peripheral portion of the substrate than at the center portion thereof.
3. (Previously Presented) The substrate cleaning method according to claim 1, wherein in said spin dry process, when the pure-water feed point to the substrate reaches a position separated from the center of the substrate by a predetermined distance, movement of said pure-water feed point is temporarily stopped, and a nitrogen gas is sprayed to the center portion of the substrate, after which spraying of said nitrogen gas is stopped and said pure-water feed point is moved out of the substrate again.
4. (Previously Presented) The substrate cleaning method according to claim 3, wherein in said spin dry process, the pure-water feed point to the substrate is moved to a position separated from the center of the substrate by 10 to 15 mm, where movement of said pure-water feed point is temporarily stopped, and a nitrogen gas is sprayed to the center portion of the substrate for a predetermined time, after which spraying of said nitrogen gas is stopped and said pure-water feed point is moved out of the substrate again at a speed equal to or less than 3 mm/second.
5. (Previously Presented) The substrate cleaning method according to claim 1, wherein in said spin dry process, after the pure-water feed point to the substrate is shifted from the center of the substrate by a predetermined distance, a nitrogen gas is sprayed to the center portion of the substrate, after which a spray point of said nitrogen gas is moved, together with said pure-water feed point, outward from the center portion of the substrate while spraying the nitrogen gas to the substrate.
6. (Original) The substrate cleaning method according to claim 5, wherein in said spin dry process, only spraying of the nitrogen gas is stopped while moving the spray point of said

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nitrogen gas, together with said pure-water feed point, outward from the center portion of the substrate.

7. (Previously Presented) The substrate cleaning method according to claim 5, wherein a number of rotations of the substrate in said rinse process is set equal to or greater than 100 rpm and equal to or less than 1000 rpm, and a number of rotations of the substrate in said spin dry process is set equal to or greater than 800 rpm and equal to or less than 2500 rpm.

8. (Previously Presented) The substrate cleaning method according to claim 1, wherein a number of rotations of the substrate at a time of the spin dry process is set greater than a number of rotations of the substrate at a time of the rinse process.

9. (Original) The substrate cleaning method according to claim 8, wherein a number of rotations of the substrate in said rinse process is set equal to or greater than 100 rpm and equal to or less than 1000 rpm, and a number of rotations of the substrate in said spin dry process is set equal to or greater than 1500 rpm and equal to or less than 2500 rpm.

10-33. (Canceled)

34. (New) The substrate cleaning method according to claim 1, wherein the transition operation comprises reducing a feed amount of the pure water from the first feed amount to the second feed amount.

35. (New) The substrate cleaning method according to claim 1, wherein the transition operation comprises setting a number of rotations of the target substrate at a value higher than that of the rinse process.

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36. (New) The substrate cleaning method according to claim 35, wherein the transition operation comprises increasing the number of rotations of the target substrate to a value to be used in the spin dry process.